REMARKS

Claims 1-36 are all the claims pending in the application.

In response to the Amendment filed April 14, 2003, the Examiner removed all of the previous claim rejections. The current status of the claims is the following.

Claims 1, 3-5, 7, and 8 are rejected under 35 U.S.C. § 102(b) as being anticipated by newly-cited Verdiell et al. (US 5,870,417, hereafter "Verdiell"). Claims 1, 3-5, 7, and 8 are rejected under 35 U.S.C. § 102(b) as being anticipated by newly-cited Hamakawa et al. (US 5,995,692, hereafter "Hamakawa"). Claims 1, 2, 5, 6, 9-29, 31, 33, and 35 are rejected under 35 U.S.C. § 102(b) as being anticipated by newly-cited Kawai et al. (US 6,345,138, hereafter "Kawai"). Claims 30, 32, 34, and 36 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Kawai et al. in view of prior art FIG. 17 and the prior art disclosure.

Verdiell relates to laser devices that have stabilized wavelength operation and suppression of longitudinal mode hopping and more particularly to laser devices employing a semiconductor gain medium optically coupled to an external cavity in the form of an optical waveguide including a Bragg reflector, such as an optical fiber or a planar silica waveguide with a Bragg grating, forming an optical resonant cavity of stabilized wavelength operation, which we refer to as waveguide distributed feedback reflector lasers or waveguide DBR lasers or fiber DBR lasers. Fig. 1 of Verdiell shows an embodiment of a waveguide DBR laser source 10. DBR laser source 10 comprises a laser diode 12, such as a InGaAs/GaAs or InGaAsP/InP diode having an active region 18 comprising a strained or unstrained multiple quantum well structure. Rear facet 14 of the diode is of high reflectivity (HR) while the front or exit facet 16 is anti-

reflection (AR) coated, so that the unwanted Fabry-Perot modes of the diode chip itself are significantly reduced if not eliminated.

Hamakawa relates to a light emitting device module including a semiconductor device such as a semiconductor laser amplifier (SLA), which outputs light having a predetermined wavelength, and a method of making the same. As shown in FIG. 1, a conventional semiconductor laser amplifier (SLA) A, which serves as a light emitting source, and an optical fiber B with a grating, which is a waveguide. In the SLA A, an active layer D is formed between cladding layers C, whereas a light exit facet E and a light reflecting facet F are respectively arranged at both end facets of the active layer D. The light exit facet E has a low light reflectivity, and the light reflecting facet F has a high light reflectivity. The optical fiber B is arranged such that its end facet faces the light exit facet E of the SLA A. In its core G, a diffraction grating H is a region such that the refractive index periodically changes along the longitudinal direction of the core G. The diffraction grating H and the light reflecting facet F constitute a resonator for laser oscillation. An SLA A1 shown in FIG. 4 is configured to prevent the light from resonating between the light reflecting facet F and the light exit facet E, so as to improve its characteristics.

Kawai relates to an optical fiber semiconductor device effective as a laser light source, i.e., a combination of an optical fiber and a semiconductor laser. FIGS. 2A and 2B show a basic structure of Kawai's device. A laser beam output from a semiconductor laser chip 100 of edge emitting type passes through a tapered optical waveguide 110, changing its optical beam shape. Then, the beam is incident on an optical fiber 120.

Claim 1 is amended to include the limitations of claims 5 and 9. Accordingly, claims 5 and 9 are cancelled. Also, claims 16 and 22 are canceled to avoid having redundant claims. Additionally, claims 30 and 31 are rewritten in independent form.

Applicant submits that the prior art fails to teach or suggest the feature of proposed amended claim 1 of the external resonator being constituted by an end facet, on the opposite side from the semiconductor light-emitting device, of the optical waveguide device, and the wavelength selector. The Examiner asserts that Kawai discloses these features of the claim, but Applicant disagrees. In particular, the Examiner refers to FIG. 12 of Kawai, which shows a semiconductor laser chip 100, optical waveguide 110, and optical fiber 120 having fiber gratings 122-1 and 122-2. However, Kawai does not disclose or suggest that an end facet of the optical waveguide 110 constitutes one end of a resonator. In one embodiment, the reference discloses that the optical fiber 120 and the HR film 104 of the semiconductor laser chip 100 constitute an optical resonator. Col. 6, lines 13-14 (See FIG. 4E). Thus, this embodiment does not disclose the external resonator being constituted by an end facet of the optical waveguide device and the wavelength selector.

With regard to FIG. 12, the reference discloses the following:

> FIG. 12 shows a structure in which both edges of an edge emitting type semiconductor chip are AR-processed and a tapered optical waveguide and an optical fiber are connected to each edge. Two optical fibers 120 have fiber gratings 122-1 and 122-2. The reflectance of the two fiber gratings 122-1 and 122-2 may be set to desired values. For example, the fiber grating 122-1 has a relatively high reflectance, so that a part of the optical output passed therethrough can be received by a photodiode and used for an APC (automatic output power control) monitor. The fiber grating 122-2 has a relatively low reflectance, so that light passed therethrough can be used as an external output light.

This disclosure fails to indicate that an end facet of the optical waveguide device constitutes an external resonator with a wavelength selector.

Therefore, claim 1 and its dependent claims 2, 5, 6, 10-29, 31, 33, and 35 are not anticipated by Kawai.

With further regard to claim 19, Applicant submits that claim 19 is not anticipated by Kawai, because Kawai fails to teach or suggest an end facet of an optical waveguide device that constitutes an external resonator. As noted above, the optical waveguide 110 of Kawai is not disclosed as having an end facet that constitutes an external resonator. Thus, claim 19 is allowable for this reason, in addition to the reason of its dependence from claim 1.

Also, Applicant submits that claim 29 is not anticipated by Kawai. The Examiner asserts that FIG. 12 of Kawai shows the feature of claim 29 of the wavelength selector and the semiconductor light-emitting device being coupled directly with each other. However, FIG. 12 actually shows that the optical waveguide 110 is disposed between the semiconductor laser chip 100 and the fiber gratings 122-1 and 122-2. Hence, claim 29 is not anticipated by Kawai for this additional reason.

Regarding claim 31, the Examiner admits that Kawai fails to disclose the claimed drive circuit, but asserts that a driver circuit is inherent in the system taught by Kawai. Applicant submits that even assuming, *arguendo*, that "a driver circuit" is inherent in Kawai, the specifically claimed driver circuit is not taught or suggested or inherent in the reference. Claim 31 recites a drive circuit that drives the semiconductor light-emitting device with high-frequency superposition. The reference does not disclose or suggest the recited feature of high-frequency

superposition, and Applicant submits there is no basis by which to assume that such a feature is inherent in Kawai. Thus, claim 31 is allowable for this reason too.

For the rejections of claims 1, 3-5, 7, and 8, Applicant submits that claims 1, 3-5, 7, and 8 are not anticipated by Verdiell or Hamakawa, at least because Verdiell and Hamakawa do not teach or suggest all of the limitations of independent claim 1.

For claims 30, 32, 34, and 36, Applicant submits that there is no suggestion or motivation

103 to combine the references. The Examiner asserts that the motivation for combining the references would have been to resonate a desired light frequency within a resonant cavity. However, as disclosed in the present specification beginning on page 1, the conventional art already disclosed resonating a desired light frequency within a resonant cavity. Thus, there would be no motivation to modify the teachings of the prior art disclosure to include a feature already present in the conventional art. Therefore, claims 30, 32, 34, and 36 are allowable over the prior art.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

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